(b) [Reserved]

[CGFR 69–72, 34 FR 17483, Oct. 29, 1969]

PART 76—FIRE PROTECTION EQUIPMENT

Subpart 76.01—Application

Sec.

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Subpart 76.27—Electric Fire Detecting System, Details

Subpart 76.30—Pneumatic Fire Detecting System, Details

Subpart 76.33—Smoke Detecting System, Details

AUTHORITY: 46 U.S.C. 3306; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; 49 CFR 1.46.

SOURCE: CGFR 65–50, 30 FR 16940, Dec. 30, 1965, unless otherwise noted.

Subpart 76.01—Application

§ 76.01–1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

(b) [Reserved]

§ 76.01–2 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a). To enforce any edition other than that specified in paragraph (b) of this section, the Coast Guard must publish notice of change in the FEDERAL REGISTER and make the material available to the public. All approved material is on file at the Office of the Federal Register, 800 North Capitol Street NW, suite 700, Washington, DC, and at the U.S. Coast Guard, Office of Design and Engineering Standards (G–MSE), 2100 Second Street SW., Washington, DC 20593–0001 and is available from the sources indicated in paragraph (b) of this section.

(b) The material approved for incorporation by reference in this part and the sections affected are:

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

100 Barr Harbor Drive, West Conshohocken, PA 19428–2959.

ASTM F 1121–87 (1993), Standard Specification for International Shore Connections for Marine Fire Applications—76.10–10

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

1 Batterymarch Park, Quincy, MA 02269–9101

NFPA 13–1996, Standard for the Installation of Sprinkler Systems—76.25–1

[CGD 88–032, 56 FR 35824, July 29, 1991; 57 FR 31947, July 20, 1992, as amended by CGD 95–072, 60 FR 50463, Sept. 29, 1995; CGD 96-041, 61 FR 50729, Sept. 27, 1996; CGD 97–057, 62 FR 51045, 51204, Sept. 30, 1997; USCG–1999–5151, 64 FR 67181, Dec. 1, 1999]

§ 76.01–5 Equipment installed but not required.

(a) Where fire detecting or extinguishing systems or equipment are not required, but are installed, the system or equipment and its installation shall meet the requirements of this part.

(b) [Reserved]

Subpart 76.05—Fire Detecting and Extinguishing Equipment, Where Required

§ 76.05–1 Fire detecting systems.

(a) Approved fire detecting systems shall be installed in locations as required by table 76.05–1(a) on the following vessels:

(1) Any vessel on an international voyage.

(2) Any vessel of more than 150 feet in length having sleeping accommodations for passengers.

TABLE 76.05–1(a)

Space	Detecting systems	Fixed extinguishing systems
Safety areas		
Wheelhouse or fire-control room	None required[1]	None required[1]
Stairway and elevator enclosures	do[1]	Do.[1]
Communication corridors	do[1]	Do.[1]
Lifeboat embarkation and lowering stations	do	Do.
Radio room	do[1]	Do.[1]
Accommodations		
Staterooms, toilet spaces, isolated pantries, etc	do[1]	Do.[1]
Offices, lockers, and isolated storerooms	Electric, pneumatic, or automatic sprinkling[1]	Do.[1]
Public spaces	None required with 20-minute patrol. Electric, pneumatic, or automatic sprinkling with 1 hour patrol[1].	Do.[1]
Open decks or enclosed promenades	None required	Do.
Service spaces		
Galleys	do[1]	Do.[1]
Main pantries	do[1]	Do.[1]
Motion picture booths and film lockers	Electric, pneumatic, or automatic sprinkling[1 2].	Do.[1 2]
Paint and lamp rooms	Smoke detecting[3]	Carbon dioxide.[4]
Inaccessible baggage, mail, and specie rooms and storerooms.	Smoke detecting[3]	Carbon dioxide.[4]
Accessible baggage, mail, and specie rooms and storerooms.	Electric, pneumatic, or automatic sprinkling.	None required.[1]
Refrigerated storerooms	None required	Do.
Carpenter, valet, photographic, and printing shops, sales rooms, etc.	Electric, pneumatic, or automatic sprinkling.	Do.[1]
Machinery spaces		
Coal fired boilers: Bunker and boiler space	None required	Do.[1]
Oil fired boilers: Spaces containing oil fired boilers either main or auxiliary, their fuel oil service pumps, and/or such other fuel oil units as the heaters, strainers, valves, manifolds, etc., that are subject to the discharge pressure of the fuel oil service pumps, together with adjacent spaces to which oil can drain.	do	Carbon dioxide or foam.[5]
Internal combustion or gas turbine propelling machinery spaces.	do	Carbon dioxide.[6]
Electric propulsive motors or generators of open type	do	None required.
Enclosed ventilating systems for motors and generators of electric propelling machinery.	do	Carbon dioxide (in ventilating system)[7]
Auxiliary spaces, internal combustion or gas turbine	do	Carbon dioxide.[8]
Auxiliary spaces, electric motors or generators	do	None required.
Auxiliary spaces, steam	do	Do.
Trunks to machinery spaces	do	Do.
Fuel tanks	do	Do.[9]
Cargo spaces		
Inaccessible during voyage (combustible cargo), including trunks (excluding tanks).	Smoke detecting	Carbon dioxide.[4]
Accessible during voyage (combustible cargo)	Smoke detecting, electric, pneumatic or automatic sprinkling.	Automatic or manual sprinkling.
Vehicular deck (except where no overhead deck is 30 feet in length or less).	None required	Manual sprinkling.
Cargo oil tanks	do	Carbon dioxide or foam.[4]
Specially suitable for vehicles	Smoke detecting, electric, pneumatic or automatic sprinkling.	Carbon dioxide, automatic or manual sprinkling.

[1] Vessels of 100 gross tons and over contracted for on or before May 27, 1936, and having combustible joiner work; shall be fitted with an automatic sprinkling system, except in relatively incombustible spaces.

[2] Sprinkler heads may be attached to sanitary system provided electrical or pneumatic detecting is installed.

[3] On vessels contracted for prior to November 19, 1952, electric or pneumatic detecting may be substituted.

[4] On vessels contracted for prior to January 1, 1962, a steam smothering system may be accepted. However, although existing steam smothering systems may be repaired, replaced, or extended, no new system contracted for on or after January 1, 1962, will be permitted.

[5] Protection of auxiliary boilers, fuel oil units, valves and manifolds not required on vessels contracted for prior to November 19, 1952.

[6] Not required on vessels of less than 300 gross tons (except on an international voyage) using fuel with a flashpoint higher than 110 °F., where the space is normally manned.

[7] Not required on vessels contracted for prior to November 19, 1952.

[8] Not required on vessels of less than 300 gross tons nor on vessels contracted for prior to November 19, 1952, except where fuel, including starting fuel, has a flashpoint of 110 °F. or less.

[9] Where fuel having a flashpoint of 110 °F. or lower is used, the space containing the fuel tanks shall be protected by a carbon dioxide system.

(3) Any vessel of 150 feet or less in length, not on an international voyage, having sleeping accommodations for 50 or more passengers. Vessels in this category are not required to have a detecting system in the cargo spaces.

(b) The arrangements and details of the fire detecting systems shall be as set forth in subparts 76.25 through 76.33.

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGFR 65–33, 31 FR 15282, Dec. 6, 1966]

§ 76.05–5 Manual alarm system.

(a) An approved manual alarm system shall be installed in all areas, other than the main machinery spaces, which are normally accessible to the passengers or crew on any vessel having sleeping accommodations for passengers or on any vessel on an international voyage.

(b) The arrangement and details of the manual alarm system shall be as set forth in subpart 76.35.

§ 76.05–10 Supervised patrol system.

(a) A supervised patrol or watchman system shall be provided on all vessels as set forth in §§ 78.30–10 and 78.30–15 of this subchapter.

(b) [Reserved]

§ 76.05–15 Fire main system.

(a) Fire pumps, hydrants, hose, and nozzles shall be installed on the following vessels:

(1) On all self-propelled vessels.

(2) After July 1, 1957, on all barges with sleeping accommodations for more than six persons.

(b) The arrangement and details of the fire main system shall be as set forth in subpart 76.10.

§ 76.05–20 Fixed fire extinguishing systems.

Approved fire extinguishing systems must be installed, as required by table 76.05–1(a) on all self-propelled vessels and on all barges with sleeping accommodations for more than six persons. Previously approved installations may be retained as long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

[CGD 95–027, 61 FR 35138, July 5, 1996]

§ 76.05–25 Hand portable fire extinguishers and semiportable fire extinguishing systems.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed on all vessels as set forth in subpart 76.50.

(b) [Reserved]

Subpart 76.10—Fire Main System, Details

§ 76.10–1 Application.

(a) The provisions of this subpart, with the exception of § 76.10–90, shall apply to all fire main installations contracted for on or after May 26, 1965. Installations contracted for prior to May 26, 1965, shall meet the requirements of § 76.10–90.

(b) [Reserved]

§ 76.10–3 Water availability.

(a) On all vessels on an international voyage, regardless of the date of construction, water pressure from the firemain protecting enclosed spaces shall be immediately available by maintenance of water pressure on the firemain at all times when passengers are aboard the vessel, or by remote control of fire pumps which control shall be easily operable and readily accessible.

(b) Where approved remote controls are not installed, an alarm shall be fitted which will sound in the engine room indicating a drop of water pressure on the system.

[CGFR 67–87, 32 FR 19181, Dec. 20, 1967]

§ 76.10–5 Fire pumps.

(a) Vessels shall be equipped with independently driven fire pumps in accordance with table 76.10–5(a).

TABLE 76.10–5(a)

Gross tons		Minimum number of pumps		Hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over	International voyage	Other			
.....	100	2	1	1½	½	50
100	500	2	1	1½	⅝	50
500	1,500	2	2	1½	⅝	50
1,500	4,000	2	2	[1] 2½	[1] ⅞	[1] 50
4,000	.....	3	3	[1] 2½	[1] ⅞	[1] 50

[1] 75 feet of 1½-inch hose and ⅝-inch nozzles may be used where specified by § 76.10–10(b).

(b) Vessels on an international voyage shall have a minimum total fire pump capacity at least equal to two-thirds of the required total bilge pump capacity, but in no case less than that required by this section. Each of the required fire pumps shall have a capacity not less than 80 percent of the total required capacity divided by the number of required pumps.

(c) Each pump shall be capable of delivering water simultaneously from the two highest outlets at a Pitot tube pressure of approximately 50 p. s. i. Where one or both of these outlets is a 1½-inch siamese fitting, both branches of the siamese fitting at each such outlet shall be utilized for the purpose of this requirements.

(d) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 p. s. i. in excess of the pressure necessary to maintain the requirements of paragraph (c) of this section or 125 p. s. i., whichever is greater. Relief valves may be omitted if the pumps, operating under shutoff conditions, are not capable of developing a pressure exceeding this amount.

(e) Fire pumps shall be fitted with a pressure gauge on the discharge side of the pumps.

(f) Fire pumps may be used for other purposes provided at least one of the required pumps is kept available for use on the fire system at all times. In no case shall a pump having connection to an oil line be used as a fire pump. Branch lines connected to the fire main for purposes other than fire and deck wash shall be arranged so that the requirements of paragraphs (b) and (c) of this section and any other services installed on the fire main can be met simultaneously.

(g) The total area of the pipes leading from a pump shall not be less than the discharge area of the pump.

(h) On vessels with oil fired boilers, either main or auxiliary, or with internal combustion propulsion machinery, where 2 fire pumps are required, they shall be located in separate spaces and the arrangement of pumps, sea connections, and sources of power shall be such as to insure that a fire in any one space will not put all of the fire pumps out of operation. However, in vessels of less than 300 feet in length, where it is shown to the satisfaction of the Commandant that it is unreasonable or impracticable to meet this requirement due to the size or arrangement of the vessel, or for other reasons, the installation of a total flooding carbon dioxide system may be accepted as an alternate method of extinguishing any fire which would affect the powering and operation of at least one of the required fire pumps.

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGD 95–028, 62 FR 51204, Sept. 30, 1997]

§ 76.10–10 Fire station hydrants, hose and nozzles–T/ALL.

(a) The size of fire hydrants, hose, and nozzles and the length of hose required shall be as noted in table 76.10–5(a).

(b) In lieu of the 2½-inch hose and hydrants specified in table 76.10–5(a), on vessels over 1,500 gross tons, the hydrants in interior locations may have siamese connections for 1½-inch hose. In these cases the hose shall be 75 feet in length, and only one hose will be required at each fire station; however, if all such stations can be satisfactorily served with 50-foot lengths, 50-foot hose may be used.

(c) On vessels of 500 gross tons and over there must be at least one shore connection to the fire main available to each side of the vessel in an accessible location. Suitable cut-out valves and check valves must be provided. Suitable adaptors also must be provided for furnishing the vessel's shore connections with couplings mating those on the shore fire lines. Vessels of

500 gross tons and over on an international voyage, must be provided with at least one international shore connection complying with ASTM F 1121 (incorporated by reference, see § 76.01–2). Facilities must be available enabling an international shore connection to be used on either side of the vessel.

(d) Fire hydrants shall be of sufficient number and so located that any part of the vessel, other than main machinery spaces, accessible to the passengers or crew while the vessel is being navigated and all cargo holds may be reached with at least two streams of water from separate outlets, at least one of which shall be from a single length of hose. For the purpose of this requirement, all watertight doors and all doors in main vertical zone bulkheads and stairway enclosures shall be closed, although hose ports may be installed in doors other than watertight doors and doors in main vertical zone bulkheads for the passage of the hose. In main machinery spaces, all portions at such spaces shall be capable of being reached by at least two streams of water, each of which shall be from a single length of hose from separate outlets; however, this requirement need not apply to shaft alleys containing no assigned space for the stowage of combustibles. Fire hydrants shall be numbered as required by § 78.47–20 of this subchapter.

(e) All parts of the fire main located on exposed decks shall either be protected against freezing or be fitted with cut-out valves and drain valves so that the entire exposed parts of such piping may be shut off and drained in freezing weather. Except when closed to prevent freezing, such valves shall be sealed open.

(f) The outlet at each fire hydrant shall be provided with a cock or valve fitted in such a position that the fire hose may be removed while the firemain is under pressure. In addition, the outlet shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead horizontally or downward to minimize the possibility of kinking.

(g) Each fire hydrant must have at least one length of fire hose, a spanner, and a hose rack or other device for stowing the hose.

(h) Fire hose shall be connected to the outlets at all times. However, on open decks where no protection is afforded to the hose in heavy weather, or where the hose may be liable to damage from the handling of cargo the hose may be temporarily removed from the hydrant and stowed in an accessible nearby location.

(i) Fire hose shall not be used for any other purpose than fire extinguishing and fire drills.

(j) Each firehose on each hydrant must have a combination solid stream and water spray firehose nozzle that meets the requirements in subpart 162.027 of this chapter. Firehose nozzles previously approved under subpart 162.027 of this chapter may be retained so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(k) Firehose nozzles previously approved under subpart 162.027 of this chapter must have low-velocity water spray applicators also previously approved under subpart 162.027 of this chapter as follows—

(1) In accommodation and service areas—two firehoses; and

(2) In each propulsion machinery space containing an oil-fired boiler, internal combustion machinery, or oil fuel unit on a vessel on an international voyage or of 1000 gross tons or more—each firehose. The length of each applicator must be not more than 1.8 meters (6 feet).

(l) Fixed brackets, hooks, or other means for stowing an applicator must be next to each fire hydrant that has an applicator under paragraph (k) of this section.

(m) Fire hydrants, nozzles, and other fittings shall have threads to accommodate the hose connections noted in paragraph (l) of this section.

(n) Firehose and couplings must be as follows:

(1) Fire station hydrant connections shall be brass, bronze, or other equivalent metal. Couplings shall either—

(i) Use National Standard fire hose coupling threads for the 1½ inch (38 millimeter) and 2½ inch (64 millimeter) hose sizes, i.e., 9 threads per inch for

1½ inch hose, and 7½ threads per inch for 2½ inch hose; or

(ii) Be a uniform design for each hose diameter throughout the vessel.

(2) Each section of firehose must be lined commercial firehose that conforms to Underwriters' Laboratories, Inc. Standard 19 or Federal Specification ZZ–H–451E. Hose that bears the label of Underwriters' Laboratories, Inc. as lined firehose is accepted as conforming to this requirement.

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGFR 67–87, 32 FR 19181, Dec. 20, 1967; CGD 74–60, 41 FR 43151, Sept. 30, 1976; CGD 76–086, 44 FR 2392, Jan. 11, 1979; CGD 88–032, 56 FR 35825, July 29, 1991; CGD 95–012, 60 FR 48051, Sept. 18, 1995; CGD 95–027, 61 FR 26004, May 23, 1996; CGD 95–028, 62 FR 51204, Sept. 30, 1997; USCG–2000–7790, 65 FR 58461, Sept. 29, 2000]

§ 76.10–15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of subchapter F (Marine Engineering) of this chapter.

(b) All distribution cut-off valves shall be marked as required by § 78.47–15 of this subchapter.

(c) For vessels on an international voyage, the diameter of the fire main shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously. This is in addition to § 76.10–5(c). The discharge of this quantity of water through hoses and nozzles at a sufficient number of adjacent hydrants shall be at a minimum Pitot tube pressure of approximately 50 pounds per square inch.

§ 76.10–90 Installations contracted for prior to May 26, 1965.

(a) Installations contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 76.10–5 through 76.10–15 shall be complied with insofar as the number and general type of equipment is concerned. Existing equipment, except firehose nozzles and low-velocity water spray applicators, previously approved but not meeting the applicable requirements of §§ 76.10–5 through 76.10–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable requirements in this part.

(2) All vessels contracted for prior to November 19, 1952, shall be fitted with fire pumps, hoses, and nozzles in accordance with table 76.10–90(a)(2).

TABLE 76.10–90(a)(2)

Gross tons		Minimum number of pumps	Minimum hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over				
100	4,000	2	[1] 1½	[1] ⅝	[1] 50
4,000	.....	3	[1] 1½	[1] ⅝	[1] 50

[1] May use 50 feet of 2½-inch hose with ⅞-inch nozzles for exterior stations. May use 75 feet of 1½-inch hose with ⅝-inch nozzles for interior station in which case such interior stations shall have siamese connections.

(3) When reasonable and practicable, where two or more fire pumps are required, they shall not all be located in the same space. Vessels on an international voyage shall, however, comply with the requirements of § 76.10–5(h).

(4) The general requirements of § 76.10–5(c) through (h), § 76.10–10(d) through (i), and § 76.10–15, shall be complied with insofar as is reasonable and practicable. In addition, vessels on an international voyage shall comply with the requirements of § 76.10–5(b).

(5) Vessels on an international voyage shall comply with the requirements of § 76.10–3.

(6) Firehose nozzles and low-velocity spray applicators must meet the requirements of §§ 76.10–10(j), 76.10–10(k), and 76.10–10(l)

(b) [Reserved]

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGFR 67–87, 32 FR 19181, Dec. 20, 1967; CGD 76–086, 44 FR 2392, Jan. 11, 1979; CGD 95–027, 61 FR 26004, May 23, 1996; USCG–2000–7790, 65 FR 58461, Sept. 29, 2000]

Subpart 76.13—Steam Smothering Systems

§ 76.13–1 Application.

Steam smothering systems are not permitted on vessels contracted for on

or after January 1, 1962. Previously approved installations may be retained as long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

[CGD 95–027, 61 FR 26004, May 23, 1996]

§ 76.13–90 Installations contracted for prior to January 1, 1962.

(a) Installations contracted for prior to July 1, 1935, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) The main pipes and their branches to the cargo compartments and similar spaces shall be not less than 1½-inch pipe size and shall emanate from not more than two stations in easily accessible locations. If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing which shall be marked as required by § 78.47–17 of this subchapter. Each branch line shall have a valve at the manifold which shall be marked as required by § 78.47–15 of this subchapter.

(3) Branches to paint lockers and similar small spaces may be taken from the nearest stream supply line and shall be not less than ¾-inch pipe size. The valve shall be marked as required by § 78.47–15 of this subchapter.

(b) Installations contracted for on or after July 1, 1935, but prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from the main or auxiliary boilers to provide at least one pound of steam per hour for each 50 cubic feet of gross volume of the largest compartment protected. Where reasonable and practicable, the steam pressure shall be at least 100 p.s.i.

(3) The piping system shall meet the general requirements of paragraphs (c)(5) through (12) of this section insofar as is reasonable and practicable.

(4) The minimum size of distribution piping and the number of branches to the various spaces shall be as given in table 76.13–90(b)(4) or by the following formula:

$$D=\sqrt{C}/30{,}000 \quad (1)$$

where:

D=Required diameter of pipe in inches.
C=Volume of compartment in cubic feet.

TABLE 76.13–90(b)(4)

Volume of compartment in cubic feet		Number of branches to compartment	Pipe size of each branch, inches
Over	Not over		
.....	30,000	1	1
30,000	46,000	1	1¼
46,000	67,000	1	1½
67,000	94,000	.....	1¼
94,000	135,000	2	1½
135,000	203,000	3	1½

(5) The minimum size of the steam supply line from the boiler to the distribution and manifold shall be as given by the following formula:

$$D=\sqrt{C}/60{,}000 \quad (2)$$

where:

D=Diameter of pipe in inches.
C=Volume of all compartments in cubic feet.

(c) Installations contracted for on or after November 19, 1952, but prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from main or auxiliary boilers to provide at

least one pound of steam per hour for each 12 cubic feet of the gross volume of the largest compartment to be protected.

(3) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of steam required, a cargo compartment will be considered as the space between adjacent watertight or firescreen bulkheads and from tank top or lowest deck to the deck head of the uppermost deck on which cargo may be carried. If a trunk extends beyond such deck, the trunk space shall be included. Tonnage openings shall be considered as sealed for this purpose.

(4) A steam pressure of at least 100 p.s.i. shall be available unless specifically approved otherwise.

(5) All piping, valves, and fittings shall meet the applicable requirements of subchapter F (Marine Engineering) of this chapter.

(6) The distribution piping shall emanate from not more than three stations in easily accessible locations on the weather deck, and shall lead to the lower portion of each cargo hold, cargo 'tween deck, and other compartments protected. However, lines to paint lockers and similar small spaces may be taken from the nearest steam supply line.

(7) The distribution line to each compartment shall be fitted with a shutoff valve. The valve shall be marked as required by §78.47–15 of this subchapter.

(8) The manifold steam supply line shall be fitted with a master valve at the manifold.

(9) Provisions shall be made for draining the manifold and distribution lines to prevent them from freezing.

(10) If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing. In any case, it shall be marked as required by §78.47–17 of this subchapter.

(11) Piping shall not be led into or through spaces accessible to the passengers or crew while the vessel is being navigated, with the exception of machinery spaces and corridors. However, in special cases, arrangements to run piping through such spaces may be specifically approved by the Commandant, provided all joints are welded, suitable expansion bends are provided, and all piping is extra heavy.

(12) Piping shall be used for no other purpose except that it may be incorporated with the fire detecting system, and where suitable provisions are made, it may be used for steaming out tanks.

(13) The minimum size and number of branches to the various spaces shall be as given in table 76.13–90(c)(13). The distribution piping from the manifold to the branch lines shall have an area approximately equal to the combined areas of the branch lines served.

TABLE 76.13–90(c)(13)

Volume of spaces in cubic feet		Number of branches to spaces	Pipe size of each branch, inches
Over	Not over		
.....	500	1	¾
500	5,000	1	1
5,000	15,000	1	1¼
15,000	30,000	1	1½
30,000	60,000	2	1½
60,000	100,000	3	1½
100,000	190,000	4	1½

(14) The steam supply line from the boiler to any distribution manifold shall be of sufficient size to supply all the branch lines to the largest compartment and to all adjacent compartments.

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGFR 66–33, 31 FR 15283, Dec. 6, 1966]

Subpart 76.15—Carbon Dioxide Extinguishing Systems, Details

§76.15–1 Application.

(a) Where a carbon dioxide extinguishing system is installed, the provisions of this subpart, with the exception of §76.15–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of §76.15–90.

(b) The requirements of this subpart are based on a ''high pressure system'', i.e., one in which the carbon dioxide is stored in liquid form at atmospheric temperature. Details for ''low pressure systems'', i.e., those in which the carbon dioxide is stored in liquid form at

a continuously controlled low temperature, may be specifically approved by the Commandant where it is demonstrated that a comparable degree of safety and fire extinguishing ability is achieved.

§ 76.15–5 Quantity, pipe sizes, and discharge rate.

(a) *General.* The amount of carbon dioxide required for each space shall be as determined by the following paragraphs in this section.

(b) *Total available supply.* A separate supply of carbon dioxide need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(c) *Cargo spaces.* (1) The number of pounds of carbon dioxide required for each space in cubic feet shall be equal to the gross volume of the space in cubic feet divided by 30.

(2) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of carbon dioxide required, a cargo compartment will be considered as the space between adjacent watertight or firescreen bulkheads and from the tank top or lowest deck to the deck head of the uppermost space on which cargo may be carried. If a trunk extends beyond such deck, the trunk volume shall be included. Tonnage openings shall be considered as sealed for this purpose.

(3) Branch lines to the various cargo holds and 'tween decks shall not be less than ¾ inch standard pipe size.

(4) No specific discharge rate need be applied to such systems.

(d) *Machinery spaces, paint lockers, tanks, and similar spaces.* (1) Except as provided in paragraph (d)(3) of this section, the number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space divided by the appropriate factor noted in table 76.15–5(d)(1). If fuel can drain from the compartment being protected to an adjacent compartment, or if the compartments are not entirely separate, the requirements for both compartments shall be used to determine the amount of carbon dioxide to be provided. The carbon dioxide shall be arranged to discharge into both such compartments simultaneously.

TABLE 76.15–5(d)(1)

Gross volume of compartment, cubic feet		Factor
Over	Not over	
.....	500	15
500	1,600	16
1,600	4,500	18
4,500	50,000	20
50,000	.....	22

(2) For the purpose of the above requirement of this paragraph, the volume of a machinery space shall be taken as exclusive of the normal machinery casing unless the boiler, internal combustion machinery, or fuel oil installations extend into such space in which case the volume shall be taken to the top of the casing or the next material reduction in casing area, whichever is lower. For installations contracted for on or after October 1, 1959, ''normal machinery casing'' and ''material reduction in casing area'' shall be defined as follows:

(i) By ''normal machinery casing'' shall be meant a casing the area of which is not more than 40 percent of the maximum area of the machinery space.

(ii) By ''material reduction in casing area'' shall be meant a reduction to at least 40 percent of the casing area.

(3) For vessels on an international voyage contracted for on or after May 26, 1965, the amount of carbon dioxide required for a space containing propulsion boilers or internal combustion propulsion machinery shall be as given by paragraphs (d) (1) and (2) of this section or by dividing the entire volume, including the casing, by a factor of 25, whichever is the larger.

(4) Branch lines to the various spaces shall be as noted in table 76.15–5(d)(4).

TABLE 76.15–5(d)(4)

Maximum quantity of carbon dioxide required, pounds	Minimum nominal pipe size, inches	Maximum quantity of carbon dioxide required, pounds	Minimum nominal pipe size, inches
100	½	2,500	2½
225	¾	4,450	3
300	1	7,100	3½
600	1¼	10,450	4
1,000	1½	15,000	4½

TABLE 76.15–5(d)(4)—Continued

Maximum quantity of carbon dioxide required, pounds	Minimum nominal pipe size, inches	Maximum quantity of carbon dioxide required, pounds	Minimum nominal pipe size, inches
2,450	2		

(5) Distribution piping within the space shall be proportioned from the supply line to give proper distribution to the outlets without throttling.

(6) The number, type, and location of discharge outlets shall be such as to give a uniform distribution throughout the space.

(7) The total area of all discharge outlets shall not exceed 85 percent nor be less than 35 percent of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square inches shall be determined by multiplying the factor 0.0022 by the number of pounds of carbon dioxide required, except that in no case shall this outlet area be less than 0.110 square inch.

(8) The discharge of at least 85 percent of the required amount of carbon dioxide shall be complete within 2 minutes.

(e) *Spaces specially suitable for vehicles.* (1) The number of pounds of carbon dioxide required shall be equal to the gross volume of the largest ''tight'' space divided by 22. In no case, however, shall it be less than that required by paragraph (c) of this section.

(2) The arrangement of valves and piping shall be such that the required quantity of carbon dioxide may be discharged into any ''tight'' space. The discharge of the required quantity of carbon dioxide shall be completed within 2 minutes.

(3) Except as noted in paragraphs (e)(1) and (2) of this section, the requirements of paragraph (e) of this section shall apply.

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGFR, 66–33, 31 FR 15283, Dec. 6, 1966; CGD 95–028, 62 FR 51204, Sept. 30, 1997; USCG–1999–6216, 64 FR 53225, 53226, Oct. 1, 1999]

§ 76.15–10 Controls.

(a) Except as noted in § 76.15–20(b), all controls and valves for the operation of the system shall be outside the space protected, and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any of the spaces protected.

(b) If the same cylinders are used to protect more than one hazard, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If cylinders are used to protect only one hazard, a normally closed stop valve shall be installed between the cylinders and the hazard except for systems of the type indicated in § 76.15–5(d) which contain not more than 300 pounds of carbon dioxide.

(c) Distribution piping to the various cargo spaces shall be controlled from not more than two stations. One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space. All control stations and the individual valves and controls shall be marked as required by §§ 78.47–15 and 78.47–17 of this subchapter.

(d) Systems of the type indicated in § 76.15–5(d) shall be actuated by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Those systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

(e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

(f) Systems of the type indicated in § 76.15–5(d), other than systems for tanks, which are of more than 300 pounds of carbon dioxide, shall be

fitted with an approved delayed discharge so arranged that the alarm will be sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 300 pounds of carbon dioxide shall also have a similar delayed discharge, except for those systems for tanks and for spaces which have a suitable horizontal escape. This paragraph shall be applicable only to systems installed on or after July 1, 1957.

(g) All distribution valves and controls shall be of an approved type. All controls shall be suitably protected.

(h) Complete but simple instructions for the operation of the systems must be located in a conspicuous place at or near all pull boxes, stop valve controls and in the CO_2 cylinder storage room. On systems in which the CO_2 cylinders are not within the protected space, these instructions must also include a schematic diagram of the system and instructions detailing alternate methods of discharging the system should the manual release or stop valve controls fail to operate. Each control valve to branch lines must be marked to indicate the related space served.

(i) If the space or enclosure containing the carbon dioxide supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass-type box conspicuously located adjacent to the opening.

[CGFR 65–60, 30 FR 16940, Dec. 30, 1965, as amended by CGD 74–100R, 40 FR 6209, Feb. 10, 1975; USCG–1999–6216, 64 FR 53226, Oct. 1, 1999]

§ 76.15–15 Piping.

(a) The piping, valves, and fittings shall have a bursting pressure of not less than 6,000 p.s.i.

(b) All piping, in nominal sizes not over ¾ inch, shall be at least Schedule 40 (standard weight), and in nominal sizes over ¾ inch, shall be at least Schedule 80 (extra heavy).

(c) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(d) A pressure relief valve or equivalent set to relieve between 2,400 and 2,800 p.s.i. shall be installed in the distributing manifold or such other location as to protect the piping in the event that all branch line shut-off valves are closed.

(e) All dead end lines shall extend at least 2 inches beyond the last orifice and shall be closed with cap or plug.

(f) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(g) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture. Drains and dirt traps shall be located in accessible locations where possible.

(h) Piping shall be used for no other purpose except that it may be incorporated with the fire detecting system.

(i) Piping passing through living quarters shall not be fitted with drains or other openings within such spaces.

(j) Installation test requirements:

(1) Upon completion of the piping installation, and before the cylinders are connected, a pressure test shall be applied as set forth in this paragraph. Only carbon dioxide or other inert gas shall be used for this test.

(2) The piping from the cylinders to the stop valves in the manifold shall be subjected to a pressure of 1,000 p.s.i. With no additional gas being introduced to the system, it shall be demonstrated that the leakage of the system is such as not to permit a pressure drop of more than 150 p.s.i. per minute for a 2-minute period.

(3) The individual branch lines to the various spaces protected shall be subjected to a test similar to that described in the preceding paragraph with the exception that the pressure used shall be 600 p.s.i. in lieu of 1,000 p.s.i. For the purpose of this test, the distribution piping shall be capped within the space protected at the first joint ahead of the nozzles.

(4) In lieu of the tests prescribed in the preceding paragraphs in this section, small independent systems protecting spaces such as emergency generator rooms, lamp lockers, etc., may be tested by blowing out the piping with air at a pressure of at least 100 p.s.i.

§ 76.15–20 Carbon dioxide storage.

(a) Except as provided in paragraph (b) of this section, the cylinders shall be located outside the spaces protected, and shall not be located in any space

that might be cut off or made inaccessible in the event of a fire in any of the spaces protected.

(b) Systems of the type indicated in §76.15–5(d), consisting of not more than 300 pounds of carbon dioxide, may have the cylinders located within the space protected. If the cylinder stowage is within the space protected, the system shall be arranged in an approved manner to be automatically operated by a heat actuator within the space in addition to the regular remote and local controls.

(c) The space containing the cylinders shall be properly ventilated and designed to preclude an anticipated ambient temperature in excess of 130 degrees F.

(d) Cylinders shall be securely fastened and supported, and, where necessary, protected against injury.

(e) Cylinders shall be so mounted as to be readily accessible and capable of easy removal for recharging and inspection. Provisions shall be available for weighing the cylinders.

(f) Where subject to moisture, cylinders shall be so installed as to provide a space of at least 2 inches between the flooring and the bottom of the cylinders.

(g) Cylinders shall be mounted in an upright position or inclined not more than 30 degrees from the vertical. However, cylinders which are fitted with flexible or bent syphon tubes may be inclined not more than 80 degrees from the vertical.

(h) Where check valves are not fitted on each independent cylinder discharge, plugs or caps shall be provided for closing outlets when cylinders are removed for inspection or refilling.

(i) All cylinders used for storing carbon dioxide must be fabricated, tested, and marked in accordance with §§147.60 and 147.65 of this chapter.

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGD 84–044, 53 FR 7748, Mar. 10, 1988; USCG–1999–6216, 64 FR 53226, Oct. 1, 1999]

§76.15–25 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

(b) [Reserved]

§76.15–30 Alarms.

(a) Spaces which are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, other than paint and lamp lockers and similar small spaces, shall be fitted with an approved audible alarm in such spaces which will be automatically sounded when the carbon dioxide is admitted to the space. The alarm shall be conspicuously and centrally located and shall be marked as required by §78.47–9 of this subchapter. For systems installed on or after July 1, 1957, alarms will be mandatory only for systems required to be fitted with a delayed discharge. Such alarms shall be so arranged as to sound during the 20 second delay period prior to the discharge of carbon dioxide into the space, and the alarm shall depend on no source of power other than the carbon dioxide.

(b) [Reserved]

§76.15–35 Enclosure openings.

(a) Where mechanical ventilation is provided for spaces other than cargo and similar spaces which are protected by a carbon dioxide extinguishing system, provisions shall be made so that the ventilation system is automatically shut down with the operation of the system to that space.

(b) Where natural ventilation is provided for spaces protected by a carbon dioxide extinguishing system, provisions shall be made for easily and effectively closing off the ventilation.

(c) Means shall be provided for closing all openings to the space protected from outside such space. In this respect, relatively tight doors, shutters, or dampers shall be provided for openings in the lower portion of the space. The construction shall be such that openings in the upper portion of the space can be closed off either by permanently installed means or by the use of canvas or other material which is normally carried by the vessel.

§76.15–40 Pressure relief.

(a) Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving

excessive pressure accumulating within the compartment when the carbon dioxide is injected.

(b) [Reserved]

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGFR 66–33, 31 FR 15283, Dec. 6, 1966]

§ 76.15–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.15–5 through 76.15–40 insofar as is reasonable and practicable, with the exception of § 76.15–5(d) (1) through (3) covering spaces other than cargo spaces, which systems may be installed in accordance with paragraphs (a) (3) through (6) of this section. However, the foregoing exception shall not be permitted for vessels on an international voyage.

(3) In boilerrooms, the bilges shall be protected by a system discharging principally below the floor plates. Perforated pipe may be used in lieu of discharge nozzles for such systems. The number of pounds of carbon dioxide shall be equal to the gross volume of the boiler room taken to the top of the boilers divided by 36. In the event of an elevated boilerroom which drains to the machinery space, the system shall be installed in the engine room bilge and the gross volume shall be taken to the flat on which the boilers are installed.

(4) In machinery spaces where main propulsion internal combustion machinery is installed, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space taken to the underside of the deck forming the hatch opening divided by 22.

(5) In miscellaneous spaces other than cargo or main machinery spaces, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space divided by 22.

(6) Branch lines to the various spaces other than cargo and similar spaces, shall be as noted in table 76.15–90(a)(6). This table is based on cylinders having discharge outlets and siphon tubes of ⅜-inch diameter.

TABLE 76.15–90(a)(6)

Number of cylinders		Nominal pipe size	
Over	Not over	Inches	Type
.....	2	½	Standard.
2	4	¾	Do.
4	6	1	Extra heavy.
6	12	1¼	Do.
12	16	1½	Do.
16	27	2	Do.
27	39	2½	Do.
39	60	3	Do.
60	80	3½	Do.
80	104	4	Do.
104	165	5	Do.

(b) [Reserved]

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGFR 67–87, 32 FR 19181, Dec. 20, 1967; USCG–1999–6216, 64 FR 53226, Oct. 1, 1999]

Subpart 76.17—Foam Extinguishing Systems, Details

§ 76.17–1 Application.

(a) Where a foam extinguishing system is installed, the provisions of this subpart, with the exception of § 76.17–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.17–90.

(b) [Reserved]

§ 76.17–5 Quantity of foam required.

(a) *Area protected.* (1) For machinery and similar spaces, the system shall be so designed and arranged as to spread a blanket of foam over the entire tank top or bilge of the space protected. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(2) Where an installation is made to protect an oil fired boiler installation on a flat which is open to or can drain to the lower engine room or other space, both the flat and the lower space

shall be protected simultaneously. The flat shall be fitted with suitable coamings on all openings other than deck drains to properly restrain the oil and foam at that level. Other installations of a similar nature will be considered in a like manner.

(3) Where a system is installed to protect a tank, it shall be so designed and arranged as to spread a blanket of foam over the entire liquid surface of the tank within the range of usual trim. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(b) *Rate of application.* (1) For spaces other than tanks, the rate of discharge to foam outlets protecting the hazard shall be at least as set forth in this subparagraph.

(i) For chemical foam systems with stored ''A'' and ''B'' solutions, a total of at least 1.6 gallons per minute of the two solutions shall be discharged for each 10 square feet of area protected.

(ii) For other types of foam systems, the water rate to the dry powder generators or air foam production equipment shall be at least 1.6 gallons per minute for each 10 square feet of area protected.

(2) For tanks, the rate of discharge to foam outlets protecting the hazard shall be as set forth in paragraph (b)(1) of this section except that the value of 1 gallon per minute shall be substituted in both cases for the value of 1.6 gallons per minute.

(c) *Supply of foam producing material.* (1) There shall be provided a quantity of foam producing material sufficient to operate the equipment at the discharge rate specified in paragraph (b) of this section for a period of at least 3 minutes for spaces other than tanks, and for at least 5 minutes for tanks.

(2) A separate supply of foam agent need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(3) Where pumps are required, the water supply shall be from outside the space protected and shall in no way be dependent upon power from the space protected.

§ 76.17–10 Controls.

(a) The foam agent, its container, and all controls and valves for the operation of the system shall be of an approved type.

(b) The foam agent container and all controls and valves for the operation of the system shall be outside the space protected and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be as convenient as practicable to one of the main escapes from spaces protected, and shall be marked as required by § 78.47–17 of this subchapter. Where pumps are required, it shall not be necessary that they be started from the control space.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) The valves to the various spaces served shall be marked as required by § 78.47–15 of this chapter.

§ 76.17–15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall be used for no other purpose.

§ 76.17–20 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

(b) [Reserved]

§ 76.17–25 Additional protection required.

(a) In order that any residual fires above the floor plates may be extinguished when a foam system is installed for the protection of spaces other than tanks, at least 2 fire hydrants, in addition to those required

for the machinery space by subpart 76.10, shall be installed outside of the machinery space entrances. Such hydrants shall be fitted with sufficient hose so that any part of the machinery space may be reached with at least 2 streams of water, and each hose shall be equipped with an approved combination nozzle, applicator, and self-cleaning strainer as described in § 76.10–10(j)(3).

(b) [Reserved]

§ 76.17–90 Installations contracted for prior to November 19, 1952.

(a) Installation contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.17–5 through 76.17–20, with the exception of § 76.17–5(a)(2), insofar as is reasonable and practicable. A 6-inch blanket of foam in 5 minutes for tanks and 3 minutes for other spaces will be considered as meeting the requirements of § 76.17–5.

(b) [Reserved]

Subpart 76.23—Manual Sprinkling System, Details

§ 76.23–1 Application.

(a) Where a manual sprinkling system is installed, the provisions of this subpart, with the exception of § 76.23–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.23–90.

(b) [Reserved]

§ 76.23–5 Zoning.

(a) Separate zones may be used for each deck, and on any particular deck, spaces separated by ''A'' or ''B'' Class bulkheads may be separately zoned.

(b) On any particular deck, large common areas may be zoned in accordance with table 76.23–5(b). All such zones within one common area shall be of approximately the same size. Zones of this type shall overlap in such a manner that the end sprinkler heads of both adjoining zones will cover the identical area.

TABLE 76.23–5(b)

Square feet of common deck area		Maximum number of zones
Over	Not over	
.....	800	1
800	1,800	2
1,800	3,000	3
3,000	5,000	4
5,000	9,000	5
9,000	16,000	6
16,000	30,000	7
30,000	.....	8

§ 76.23–10 Quantity, pipe sizes, and discharge rates.

(a) *General.* (1) The system shall be so designed and arranged that the overhead is effectively sprayed and all portions of the deck are covered. The capacity shall be such that at least 12 gallons of water per minute are applied to each 100 square feet of deck area.

(2) Piping, fittings, sprinkler heads, and pumps installed in accordance with the remainder of this section will be considered as meeting the above requirements. If alternate sizes or arrangements are used, it shall be demonstrated that these minimum requirements have been met.

(b) *Sprinkler heads.* (1) Three-eighth inch open type sprinkler heads shall be used. Sprinkler heads shall be so arranged that no portion of the overhead is more than 7 feet from a sprinkler head.

(2) [Reserved]

(c) *Pipe sizes.* (1) The various pipe sizes shall be in proportion to the number of heads served. Minimum pipe sizes shall be as given in table 76.23–10(c).

TABLE 76.23–10(c)

Number of 3/8 inch heads served		Minimum nominal pipe sizes, inches
Over	Not over	
.....	1	¾
1	2	1

TABLE 76.23–10(c)—Continued

Number of 3/8 inch heads served		Minimum nominal pipe sizes, inches
Over	Not over	
2	4	1¼
4	6	1½
6	12	2
12	18	2½
18	30	3
30	46	3½
46	66	4
66	120	5

(d) *Fire pumps.* (1) The fire pumps may be used for the sprinkling system provided there is sufficient total capacity to operate the largest zone of the sprinkling system with a Pitot tube pressure of at least 15 p.s.i. at all heads and at the same time to deliver water from the two highest fire hose outlets in a manner similar to that described in §76.10–5(c). In addition, on vessels over 750 gross tons, there shall be sufficient pumping capacity to also operate the second largest zone.

§76.23–15 Controls.

(a) The controls for the system shall be outside the spaces protected, and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be marked as required by §78.47–15 of this subchapter. It shall not be necessary to start the pumps from the control space.

(b) Distribution piping to the various zones shall be controlled from one station. Each branch line to the various zones shall be fitted with a stop valve which shall be marked as required by §78.47–15 of this subchapter.

§76.23–20 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved by the Commandant.

(c) All piping, valves, fittings, and sprinkler heads shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall be used for no other purpose.

§76.23–25 Sprinkler heads.

(a) Sprinkler heads shall be of an approved type.

(b) [Reserved]

§76.23–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and replacements may be made to the same standards as the original installation.

(2) The details of the system shall be in general agreement with §§76.23–5 through 76.23–25 insofar as is reasonable and practicable. Existing piping, pumping facilities, and sprinkler heads or perforated pipes may be retained provided all portions of the overhead are effectively sprayed and all portions of the deck are covered.

(b) [Reserved]

Subpart 76.25—Automatic Sprinkling System, Details

§76.25–1 Application.

Where an automatic sprinkling system is installed, the systems shall comply with NFPA 13–1996.

[CGD 95–028, 62 FR 51204, Sept. 30, 1997]

§76.25–5 Zoning.

(a) The automatic sprinkling system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) No sprinkling zone shall contain more than 250 sprinkler heads.

(c) The sprinkling zone may cover more than one deck, in which case, the boundaries shall be maintained in a vertical line insofar as is reasonable and practicable. The boundaries of the

zone shall be coincident with bulkheads of Class ''A'' construction such as main vertical zone or watertight bulkheads.

(d) Spaces in different main vertical zones shall not be included in the same sprinkling zone.

§ 76.25–10 Size and arrangement of sprinkler heads and pipe sizes.

(a) *General.* (1) The system shall be so designed and arranged that the overhead is effectively sprayed and that all portions of the deck are covered.

(2) One-half inch sprinkler heads shall be used. Sprinkler heads shall be so arranged that no portion of the overhead or vertical projection of the deck is more than 7 feet from a sprinkler head.

(b) *Pipe sizes.* (1) The sizes of branch lines, single cross mains, feed mains, and risers shall be in proportion to the number of sprinkler heads served. The minimum pipe sizes shall be as given in table 76.25–10(b)(1).

TABLE 76.25–10(b)(1)

Minimum nominal pipe size, inches	Maximum number of heads served	
	Vessels whose construction is more combustible than that set forth in §§ 72.05–5 through 72.05–60	Vessels constructed in general agreement with §§ 72.05–5 through 72.05–60
1	2	2
1¼	3	3
1½	5	5
2	10	10
2½	20	40
3	40	250
3½	65	.....
4	100	.....
5	160	.....
6	250	.....

(2) If a complete loop cross main is employed, the size of such cross main shall be in proportion to the number of sprinkler heads served. The minimum pipe sizes shall be as given in table 76.25–10(b)(2). The entire loop shall be of the same size pipe.

TABLE 76.25–10(b)(2)

Minimum nominal pipe size, inches	Maximum number of heads served	
	Vessels whose construction is more combustible than that set forth in §§ 72.05–5 through 72.05–60	Vessels constructed in general agreement with §§ 72.05–5 through 72.05–60
1	5	5
1¼	9	9
1½	13	13
2	22	30
2½	40	80
3	80	250
3½	130	.....
4	250	.....

§ 76.25–15 Pumps and water supply.

(a) An automatically controlled pump shall be provided to supply the sprinkling system and shall be used for no other purpose. The size and capacity of the pump shall be governed by the zone having the greatest capacity need for any one deck, and shall be suitable to operate at least the number of heads noted in table 76.25–15(a) with a Pitot tube pressure of at least 15 p.s.i. at all heads (approximately 20 GPM per head). There shall also be sufficient pumping capacity available, either from the automatic pump, the fire pumps, or other source, so that in conjunction with the automatic pump the total number of heads noted in table 76.25–15(a) may be operated with the same efficiency as noted above, and at the same time to deliver water from the two highest fire hose outlets in a manner similar to that described in § 76.10–5(c). Intermediate values may be obtained by interpolation.

TABLE 76.25–15(a)

Maximum number of heads on one deck in one zone	Number of heads automatic pump to supply	Number of heads additional pumps to supply
5	5	.....
10	10	.....
20	10	10
30	12	16
40	15	18
50	15	25
60	20	25
80	20	30

TABLE 76.25–15(a)—Continued

Maximum number of heads on one deck in one zone	Number of heads automatic pump to supply	Number of heads additional pumps to supply
100	20	40
120	20	50
150	20	60
200	20	75
250	20	100

(b) [Reserved]

§ 76.25–20 Pressure tank.

(a) A pressure tank or other suitable means shall be installed to permit early action of the system pending the starting of the pump. Sufficient fresh water shall be carried in the tank to fill the piping of the largest zone, and in addition, force out at least 200 gallons at the least effective head in the zone at a Pitot tube pressure of at least 15 p.s.i. Suitable check valves shall be installed to prevent salt water from entering the pressure tank, and low water and low pressure alarms shall be fitted.

(b) [Reserved]

§ 76.25–25 Controls.

(a) The controls for the system shall be outside the spaces protected, and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be marked as required by §78.47–17 of this subchapter.

(b) Each supply line to the various zones shall be fitted with a stop valve which shall be marked as required by §78.47–15 of this subchapter. These valves shall be normally open, and shall indicate by an alarm if they are closed.

§ 76.25–30 Piping.

(a) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved by the Commandant.

(b) All piping, valves, fittings, and sprinkler heads shall be securely supported, and, where necessary, protected against injury.

(c) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(d) Piping shall be used for no other purpose.

§ 76.25–35 Operation and installation.

(a) The system shall be so arranged and installed that a fire in any of the protected spaces will open the affected sprinkler heads. Water from the pressure tank shall be immediately available to the affected sprinkler head and before the supply from the pressure tank is exhausted, the sprinkler pump shall be automatically started and shall supply the system until manually shut off. Suitable test stations shall be installed in each zone to test the operation of the system.

(b) The system shall be so arranged and installed that the presence of a fire in any of the protected spaces will automatically be registered visibly and audibly in the pilothouse or fire control station. The visible notice shall automatically indicate the zone in which the alarm originated. On vessels over 150 feet in length, there shall also be an audible alarm in the engine room.

(c) There shall be not less than two sources of power supply for the sea water pumps, air compressors and automatic alarms. Where the sources of power are electrical, these shall be a main generator and an emergency source of power. One supply shall be taken from the main switchboard, by separate feeders reserved solely for that purpose. Such feeders shall be run to a change-over switch situated near to the sprinkler unit and the switch shall normally be kept closed to the feeder from the emergency switchboard. The change-over switch shall be clearly labeled and no other switch shall be permitted in these feeders.

(d) Where subject to freezing, sprinkler systems shall be of the dry pipe type.

(e) The sprinkler heads, the cabinet, alarms, dry valves and actuating mechanisms shall be of an approved type.

(f) In general, the sprinkler heads shall be rated not lower than 135 degrees F. nor higher than 165 degrees F. However, in spaces where a high ambient temperature may be expected, sprinkler heads rated at 212 degrees F. shall be used.

(g) The automatic sprinkling system and all its components shall be used for no other purpose.

(h) All wiring and electrical circuits and equipment shall meet the applicable requirements of subchapter J (Electrical Engineering) of this chapter.

(i) All piping, valves, fittings, pressure tanks, etc., must meet the applicable requirements of subchapter F (Marine Engineering) of this chapter.

(j) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(k) The audible alarms shall be identified as required by §78.47–13 of this subchapter.

[CGFR 65–50, 30 FR 16940, Dec. 30, 1965, as amended by CGD 74–125A, 47 FR 15231, Apr. 8, 1982]

§ 76.25–90 Installations contracted for prior to September 30, 1997.

(a) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph, and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and replacements may be made to the same standards as the original installation.

(b) The details of the system shall be in general agreement with NFPA 13–1996 insofar as is reasonable and practicable. Existing piping, pumping facilities, sprinkler heads, and operating devices may be retained provided a reasonable coverage of the spaces protected is assured.

[CGD 95–028, 62 FR 51204, Sept. 30, 1997]

Subpart 76.27—Electric Fire Detecting System, Details

§ 76.27–1 Application.

(a) Where an electric fire detecting system is installed, the provisions of this subpart, with the exception of §76.27–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of §76.27–90.

(b) [Reserved]

§ 76.27–5 Zoning.

(a) The fire detecting system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) All spaces in a fire detecting zone shall be accessible from one to another without leaving the deck involved. All doors in watertight subdivision bulkheads and main vertical zone bulkheads shall be assumed closed for the purpose of this requirement.

(c) The fire detecting zone shall not include spaces on more than one deck, except:

(1) Adjacent and communicating spaces on different decks in the ends of the vessel having a combined ceiling area of not more than 3,000 square feet.

(2) Isolated rooms or lockers in such spaces as mast houses, wheelhouse top, etc., which are easily communicable with the area of the fire-detecting circuit to which they are connected.

(3) Systems with indicators for individual spaces.

(d) The fire detecting zone shall not contain more than 50 protected rooms or spaces.

§ 76.27–10 Location and spacing of detectors.

(a) The detectors shall be located close to the overhead in the space protected. Where liable to physical damage, the detector shall be suitably protected.

(b) Unless specifically approved otherwise, no spot on the overhead of a protected space shall be more than 10 feet from a detector. Where beams or

girders extend below the ceiling, or where the ceiling is installed at more than one level, the detectors shall be so located as to be most effective.

§ 76.27–15 Operation and installation.

(a) The system shall be so arranged and installed that the presence of a fire in any of the protected spaces will be automatically registered visibly and audibly in the pilothouse or fire control station. The visible notice shall indicate the zone in which the alarm originated. On vessels over 150 feet in length, there shall also be an audible alarm in the engine room.

(b) The detectors, the detecting cabinet and alarms shall be of an approved type.

(c) In general, the detectors, shall be rated not lower than 135 degrees F. and not higher than 165 degrees F. However, in spaces where a high ambient temperature may be expected, detectors shall be rated not lower than 175 degrees F. and not higher than 225 degrees F.

(d) The fire detecting system shall be used for no other purpose, except that it may be incorporated with the manual alarm system.

(e) All wiring and electrical circuits and equipment shall meet the applicable requirements of subchapter J (Electrical Engineering) of this chapter.

(f) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(g) The audible alarms shall be identified as required by §78.47–13 of this subchapter.

§ 76.27–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph, and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§76.27–5 through 76.27–15 insofar as is reasonable and practicable.

(b) [Reserved]

Subpart 76.30—Pneumatic Fire Detecting System, Details

§ 76.30–1 Application.

(a) Where a pneumatic fire detecting system is installed, the provisions of this subpart, with the exception of §76.30–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of §76.30–90.

(b) [Reserved]

§ 76.30–5 Zoning.

(a) The fire detecting system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) All spaces in a fire detecting zone shall be accessible from one to another without leaving the deck involved. All doors in watertight subdivision bulkheads and main vertical zone bulkheads shall be assumed closed for the purpose of this requirement.

(c) The fire detecting zone shall not include spaces on more than one deck, except:

(1) Adjacent and communicating spaces on different decks in the ends of the vessel, having a combined deck area of not more than 3,000 feet.

(2) Isolated rooms or lockers in such spaces as mast houses, wheelhouse top, etc., which are easily communicable with the area of the fire-detecting circuit to which they are connected.

(d) The fire detecting zone shall not include more than 50 protected rooms or spaces.

(e) Individual tubing circuits shall not contain more than 1,000 feet of pneumatic tubing or its equivalent. However, more than one tubing circuit

may be included in the same fire detecting zone.

§ 76.30–10 Location and spacing of tubing.

(a) The tubing shall be located on the overhead or within 12 inches of the overhead on the bulkheads. Where liable to physical damage, the tubing shall be suitably protected.

(b) In each enclosed space or separate room there shall be exposed at least 5 percent of the total length of tubing in that circuit, but in no case shall the amount be less than 25 feet.

(c) No spot on the overhead of a protected space shall be more than 12 feet from the nearest point of tubing. Where beams or girders extend below the ceiling, or where the ceiling is installed at more than one level, the tubing shall be so located as to be most effective.

§ 76.30–15 Operation and installation.

(a) The system shall be so arranged and installed that the presence of a fire in any of the protected spaces will automatically be registered visibly and audibly in the pilothouse or fire control station. The visible notice shall automatically indicate the zone in which the alarm originated. On vessels over 150 feet in length, there shall also be an audible alarm in the engine room.

(b) The tubing or detecting devices, pneumatic-electric converting units, detecting cabinets, and alarms shall be of an approved type.

(c) In general, the system shall be adjusted to operate at a temperature rise of approximately 40 degrees F. per minute at the center of the circuit.

(d) The fire detecting system shall be used for no other purpose except that it may be incorporated with the manual alarm system.

(e) All wiring and electrical circuits and equipment shall meet the applicable requirements of subchapter J (Electrical Engineering) of this chapter.

(f) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(g) The audible alarms shall be identified as required by § 78.47–13 of this subchapter.

§ 76.30–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.30–5 through 76.30–15 insofar as is reasonable and practicable.

(b) [Reserved]

Subpart 76.33—Smoke Detecting System, Details

§ 76.33–1 Application.

(a) Where a smoke detecting system is installed, the provisions of this subpart, with the exception of § 76.33–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.33–90.

(b) [Reserved]

§ 76.33–5 Zoning.

(a) The smoke detecting system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) The smoke detecting zone shall not include spaces on more than one deck, except the small adjacent spaces mentioned in paragraph (c) of this section.

(c) Each separate space shall be considered as a zone, except that two or three small adjacent spaces having a combined volume not exceeding 5,000

cubic feet may be connected on the same zone.

(d) Where a space is of such size that one accumulator is not sufficient, not more than two accumulators may be combined in one zone.

§ 76.33–10 Location and spacing of accumulators.

(a) Smoke accumulators shall be located overhead in each compartment. Where liable to physical damage, the accumulators and piping shall be suitably protected.

(b) No spot on the overhead of a protected space shall be more than 40 feet from an accumulator.

(c) Accumulators shall not be located closer to the opening of a ventilator than three times the diameter or equivalent diameter of the opening.

§ 76.33–15 Piping.

(a) Individual pipes shall be not less than ¾-inch standard pipe size.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) Where a smoke detecting system serves a space used alternately for liquid and dry cargo, a valve shall be installed between the tank and the detecting cabinet so that the line may be shut off when liquids are carried. When the smoke detecting system is combined with a fire extinguishing system, the operation of the valve shall not affect the operation of the fire extinguishing system.

(d) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury. The piping shall be installed with as easy bends as practicable, and shall be installed to grade to low points for drainage.

(e) Drains and dirt tapes shall be fitted where necessary to prevent the accumulation of dirt or moisutre.

§ 76.33–20 Operation and installation.

(a) The system shall be so arranged and installed that the presence of smoke in any of the protected spaces will automatically be indicated visually to an observer directly in front of the detecting cabinet. The visible notice shall automatically indicate the zone in which the smoke originated. The detecting cabinet shall normally be located in the pilothouse or fire control station. On vessels over 5,000 gross tons, there shall also be an automatic audible alarm in the wheelhouse together with an auxiliary audible alarm in the engine room.

(b) If the detecting cabinet is not located in the pilothouse or fire control station, it shall be located in convenient proximity to the valve control station of the extinguishing system. In this case, there shall be in the pilothouse or fire control station automatic visual alarms, one for each zone in which an alarm may originate, as well as an automatic audible alarm. There shall also be an auxiliary audible alarm in the engine room. For installations contracted for on or after January 1, 1962, where detecting cabinets are not located in the pilothouse or an adjacent fire control station having direct access to the pilothouse, an efficient means of direct communication shall be provided between the pilothouse and the stations where the detecting cabinets are located.

(c) A sufficient quantity of exhaust from the detecting cabinet shall be discharged in the vicinity of the cabinet to permit the detection of fire by odor. A valve shall be installed in such space to direct the exhaust, if obnoxious, to the outside.

(d) The smoke detecting system shall be used for no other purpose except that it may be incorporated with the fire extinguishing system to the spaces covered by the smoke detecting system.

(e) The accumulators, detecting cabinet, interconnecting valves with the fire extinguishing system, alarms, and indicating devices shall be of an approved type.

(f) All wiring and electrical circuits and equipment shall meet the applicable requirements of subchapter J (Electrical Engineering) of this chapter.

(g) A framed chart or diagram shall be installed adjacent to the detecting cabinet and auxiliary panel indicating the location of the various zones and giving instructions for the operation, maintenance, and testing of the system. The chart at the cabinet location

or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(h) The audible smoke detecting alarms shall be identified as required by § 78.47–13 of this subchapter.

§ 76.33–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, material, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.33–5 through 76.33–15 insofar as is reasonable and practicable.

(b) [Reserved]

Subpart 76.35—Manual Alarm System, Details

§ 76.35–1 Application.

(a) Where a manual alarm system is installed, the provisions of this subpart, with the exception of § 76.35–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.35–90.

(b) [Reserved]

§ 76.35–5 Zoning.

(a) The zoning of the manual alarm system shall meet the same requirements as for the electric fire detecting system, § 76.27–5.

(b) [Reserved]

§ 76.35–10 Location and spacing of manual alarm boxes.

(a) There shall be at least one manual alarm box in each zone.

(b) Manual alarms shall be located in main passageways, stairway enclosures, public spaces, or similar locations where they will be readily available and easily seen in case of need.

(c) In general, a sufficient number of manual alarm boxes shall be employed that a person escaping from any space would find a manual alarm box convenient on his normal route of escape.

§ 76.35–15 Operation and installation.

(a) The system shall be so arranged and installed that the presence of a fire may be reported from any of the protected spaces and be automatically registered visibly and audibly in the pilothouse or fire control station. The visible notice shall indicate the zone in which the alarm originated. There shall also be an audible alarm in the engine room.

(b) The manual alarm boxes, cabinet, and alarms shall be of an approved type.

(c) The manual alarm system shall be used for no other purpose, except that it may be incorporated with the fire detecting system.

(d) All wiring and electrical circuits and equipment shall meet the applicable requirements of subchapter J (Electrical Engineering) of this chapter.

(e) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(f) The manual alarm boxes and bells shall be identified as required by § 78.47–10 of this subchapter.

§ 76.35–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph, and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and

alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.35–5 through 76.35–15 insofar as is reasonable and practicable.

(b) [Reserved]

Subpart 76.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems, Arrangements and Details

§ 76.50–1 Application.

(a) The provisions of this subpart, with the exception of § 76.50–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 76.50–90.

(b) [Reserved]

§ 76.50–5 Classification.

(a) Hand portable fire extinguishers and semiportable fire extinguishing systems shall be classified by a combination letter and number symbol, the letter indicating the type of fire which the unit could be expected to extinguish, and the number indicating the relative size of the unit.

(b) The types of fire will be designated as follows:

(1) ''A'' for fires in ordinary combustible materials where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water, are of first importance.

(2) ''B'' for fires in flammable liquids, greases, etc., where a blanketing effect is essential.

(3) ''C'' for fires in electrical equipment where the use of nonconducting extinguishing agent is of first importance.

(c) The number designations for size will start with ''I'' for the smallest to ''V'' for the largest. Sizes I and II are considered hand portable fire extinguishers and sizes III, IV and V are considered semiportable fire extinguishing systems which shall be fitted with suitable hose and nozzle or other practicable means so that all portions of the space concerned may be covered. Examples of size graduations for some of the typical hand portable and semiportable fire extinguishing systems are set forth in table 76.50–5(c).

TABLE 76.50–5(c)

Classification		Soda acid and water, gallons	Foam, gallons	Carbon dioxide, pounds	Dry chemical, pounds
Type	Size				
A	II	2½	2½	.....	.....
B	I	.....	1¼	4	.....
B	II	.....	2½	15	10
B	III	.....	12	35	20
B	IV	.....	20	50	30
B	V	.....	40	100	50
C	I	.....	.....	4	2
C	II	.....	.....	15	10

(d) All hand portable fire extinguishers and semiportable fire extinguishing systems shall have permanently attached thereto a metallic name plate giving the name of the item, the rated capacity in gallons, quarts, or pounds, the name and address of the person or firm for whom approved, and the identifying mark of the actual manufacturer.

(e) Vaporizing-liquid type fire extinguishers, containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels.

§ 76.50–10 Location.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed in accordance with table 76.50–10(a).

TABLE 76.50–10(a)

Space	Hand portable fire extinguisher and semiportable fire extinguishing systems	
	Classification (see § 76.50–5)	Quantity and location
Safety area[1]		
Wheelhouse or fire control room	A–II, B–II, C–II.	1 of each classification on vessels over 1,000 gross tons. (Not required in both spaces.) (Multiple classification may be recognized.)
Stairway and elevator enclosures		None required.
Communicating corridors	A–II	1 in each main corridor in each main vertical zone. (May be located in stairway enclosures.)
Lifeboat embarkation and lowering stations		None required.
Radio room	C–I[3]	2 in vicinity of exit.[2]
Accommodations[1]		
Staterooms, toilet spaces, isolated pantries, etc.		None required.
Offices, lockers, and isolated storerooms		Do.
Public spaces	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, except that none required for spaces under 500 square feet.
Open decks or enclosed promenades		None required.
Service spaces		
Galleys	B–II or C–II	1 for each 2,500 square feet or fraction thereof suitable for hazards involved.
Main pantries	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits.
Motion picture booths and film lockers	C–I[3]	1 outside in vicinity of exit.
Paint and lamp rooms	B–II	1 outside space in vicinity of exit.
Inaccessible baggage, mail, and specie rooms, and storerooms.		None required.
Accessible baggage, mail, and specie rooms, and storerooms.	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, either inside or outside the spaces.
Refrigerated storerooms	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, outside the spaces.
Carpenter, valet, photographic, printing shops sales rooms, etc.	A–II	1 outside the space in vicinity of exit.
Machinery spaces		
Coal Fired Boilers: Bunker and boilerspace		None required.
Oil Fired Boilers: Spaces, containing oil fired boilers, either main or auxiliary, or their fuel oil units.	B–II, B–V	2 required.[3]1 required.[4]
Internal combustion or gas turbine propelling machinery spaces.	B–II	1 for each 1,000 B. H. P., but not less than 2 or more than 6.
	B–III	1 required.[5]
Electric propulsive motors or generators of open type.	C–II	1 for each propulsion motor or generator unit.
Enclosed ventilating systems for motors and generators of electric propelling machinery.		None required.
Auxiliary spaces, internal combustion or gas turbine.	B–II	1 outside the space in vicinity of exit.[6]
Auxiliary spaces, electric emergency motors or generators.	C–II	Do.
Auxiliary spaces, steam		None required.
Trunks to machinery spaces		Do.
Fuel tanks		Do.
Cargo spaces		
Inaccessible during voyage, including trunks (excluding tanks).		Do.
Accessible during voyage	A–II	1 for each 1,200 square feet or fraction thereof.
Vehicular spaces (covered by sprinkler system)	B–II	1, plus 1 for each 6,000 square feet or fraction thereof:
Vehicular spaces (not covered by sprinkler system).	B–II	1, plus 1 for each 1,500 square feet or fraction thereof.[7]
Cargo oil tanks		None required.

[1] In any case, on vessels of 150 feet in length, and over, there shall be at least 2 A–II units on each passenger deck.
[2] For vessels on an international voyage, substitute 1 C–II in vicinity of exit.
[3] Vessels of less than 1,000 gross tons and not on an international voyage, require 1.
[4] Vessels of less than 1,000 gross tons and not on an international voyage may substitute 1 B–IV.

[5] If oil burning donkey boiler fitted in space, the B–V previously required for the protection of the boilerroom may be substituted. Not required on vessels of less than 300 gross tons if fuel has flashpoint of 110 °F. or lower except those on an international voyage.
[6] Not required on vessels of less than 300 gross tons if fuel has flashpoint higher than 110 °F.
[7] B–I units may be substituted for 1 B–II unit.

The location of the equipment shall be to the satisfaction of the Officer in Charge, Marine Inspection. Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional equipment as he deems necessary for the proper protection of the vessel.

(b) Semiportable fire extinguishing systems shall be located in the open so as to be readily seen.

(c) If hand portable fire extinguishers are not located in the open or behind glass so that they may be readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by §78.47–20 of this subchapter.

(d) Hand portable fire extinguishers and their stations shall be numbered in accordance with §78.47–30 of this subchapter.

(e) Hand portable or semiportable extinguishers, which are required on their nameplates to be protected from freezing, shall not be located where freezing temperatures may be expected.

[CGFR 65–50, 30 FR 10940, Dec. 30, 1965, as amended by CGFR 66–33, 31 FR 15283, Dec. 6, 1966]

§76.50–15 Spare charges.

(a) Spare charges shall be carried on all vessels for at least 50 percent of each size and each variety, i.e., foam, soda-acid, carbon dioxide, etc., of hand portable fire extinguisher required by §76.50–10(a). However, if the unit is of such variety that it cannot be readily recharged by the vessel's personnel, one spare unit of the same classification shall be carried in lieu of spare charges for all such units of the same size and variety.

(b) Spare charges shall be so packaged as to minimize the hazards to personnel while recharging the units. Acid shall be contained in a Crown stopper type of bottle.

§76.50–20 Semiportable fire extinguishers.

(a) The frame or support of each size III, IV, and V fire extinguisher required by table 76.50–10(a) must be welded or otherwise permanently attached to a bulkhead or deck.

(b) If an approved size III, IV, or V fire extinguisher has wheels and is not required by table 76.50–10(a), it must be securely stowed when not in use to prevent it from rolling out of control under heavy sea conditions.

[CGD 77–039, 44 FR 34132, June 14, 1979]

§76.50–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) The provisions of §§76.50–5 through 76.50–15 shall be met with the exception that existing installations in safety areas, accommodations, service spaces, and cargo spaces may be maintained if in the opinion of the Officer in Charge, Marine Inspection, they are in general agreement with the standard of safety prescribed by table 76.50–10(a). In such cases, minor modifications may be made to the same standards as the original installation, provided that in no case will a greater departure from the standards of table 76.50–10(a) be permitted than presently exists.

(2) [Reserved]

(b) [Reserved]

Subpart 76.60—Fire Axes

§76.60–1 Application.

(a) The provisions of this subpart shall apply to all vessels.

(b) [Reserved]

§76.60–5 Number required.

(a) All vessels except barges shall carry at least the minimum number of fire axes as set forth in table 76.60–5(a). Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional fire axes as he

deems necessary for the proper protection of the vessel.

TABLE 76.60–5(a)

Gross tons		Number of axes
Over	Not over	
.....	50	1
50	200	2
200	500	4
500	1,000	6
1,000	.....	8

(b) Covered barges shall carry at least three fire axes and uncovered barges shall carry at least two fire axes.

§ 76.60–10 Location.

(a) Fire axes shall be distributed throughout the spaces available to passengers and crew so as to be most readily available in the event of emergency.

(b) If fire axes are not located in the open or behind glass so that they may be readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by §78.47–20 of this subchapter.

PART 77—VESSEL CONTROL AND MISCELLANEOUS SYSTEMS AND EQUIPMENT

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Subpart 77.40—Pilot Boarding Equipment

77.40–1 Pilot boarding equipment.

AUTHORITY: 46 U.S.C. 3306; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; 49 CFR 1.46.

SOURCE: CGFR 65–50, 30 FR 16953, Dec. 30, 1965, unless otherwise noted.

Subpart 77.01—Application

§ 77.01–1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted.

(b) [Reserved]

§ 77.01–3 Incorporation by reference.

(a) Certain materials are incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a). To enforce any edition other than the one listed in paragraph (b) of this section, notice of the change must be published in the FEDERAL REGISTER and the material made available to the public. All approved material is